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POECILOCRYPTICUS FORMICOPHILUS GEBIEN, A SOUTH AMERICAN BEETLE ESTABLISHED IN THE UNITED STATES (COLEOPTERA: TENEBRIONIDAE)[1]

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Abstract.—Poecilocrypticus formicophilus Gebien, known from the Atlantic coast of South America, has been collected recently in Alabama, Florida, and Mississippi, and is reported as a species introduced to the United States. The small, colorful beetle is apparently associated with the imported fire ant. The species is illustrated and redescribed; known distribution records and biological observations are given.

In Mississippi during February of 1978, I collected a single specimen of a very small, colorful tenebrionid beetle which proved to be difficult to identify; no similar specimens were in the National Museum of Natural History collection. The species was apparently a member of the tribe Crypticini, but the only cryptic ine known to occur in the United States is *Gondwanocrypticus obsoletus* (Say), a broadly oval, dull black species (Arnett, 1968). My specimen was examined by C. A. Triplehorn, who had seen one other example of this beetle, taken in northern Florida in May of the same year. He suspected (personal communication) that it represented an introduction.

After searching the literature and examining types I was able to identify it as *Poecilocrypticus formicophilus* Gebien (1928). The species was described from southern Brazil and northern Argentina, and presumably has been introduced to the Gulf States from South America. Three more specimens were taken by me in Alabama in April of 1980. Evidence indicates that the beetle may be associated with the imported fire ant.

The monotypic genus was described in detail by Gebien, but the general body form and male genitalia of *P. formicophilus* were not figured. Since the species apparently has become established in North America, the fol-

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lowing illustrations and brief redescription are presented, so this distinctive tenebrionid can be easily recognized by collectors. The key couplet below will separate *Poecilocrypticus* from members of the other Western Hemisphere crypticine genus, *Gondwanocrypticus*.

1. Body elongate oval in dorsal view, more than 2× as long as wide; dorsum brightly colored, with pronotum orange and elytra yellow and black ..... *Poecilocrypticus* Gebien
– Body broadly oval in dorsal view, not more than 2× as long as wide; dorsum usually dark and uniformly colored; if elytra maculate then pronotum brown or black, not orange ... *Gondwanocrypticus* Español

Poecilocrypticus formicophilus Gebien

Description.—Length 2.6–2.8 mm; greatest width 1.0–1.2 mm; greatest thickness 0.7–0.8 mm. Form elongate oval, head prognathous; dorsum brightly colored, polished, punctate (Fig. 1).

Head dark brown to black, epistoma lighter, gular area yellowish; form rounded, with evenly spaced setigerous punctures. Eye small, reniform. Antenna long, reaching base of elytron if folded back along body; basal 6 segments dull yellow, nearly twice as long as wide; apical 5 segments dark brown, thicker, nearly as wide as long. Mouthparts yellow except for dark mandibles.

Pronotum uniformly bright reddish orange, finely margined laterally, slightly wider than long, widest at midlength, rounded and narrowed anteriorly, nearly parallel sided near base; apex and base evenly truncate; dorsal surface with scattered punctures that are smaller toward middle and each with a short, inconspicuous seta. Scutellum orange, small, triangular, rounded apically, without punctures.

Elytra together as wide as pronotum, elongate, tapering to a point, with longitudinal rows of alternating large and small punctures, each with a minute, decumbent seta; color pattern dark brown to black and yellow, with a less distinct dark basal band, a prominent, wide, median quadrate patch of black extending nearly to margin, and a black apical patch across suture and extending up suture to about midlength of elytra, leaving a prominent C-shaped area of yellow on each elytron.

Ventral surfaces punctate, yellowish orange in color except apical 2 visible abdominal sterna black; punctures very fine and dense on abdominal sterna, with relatively long, fine setae. Legs yellow, setose; tibiae spiny and pubescent, with 2 large, unequal apical spurs; tarsal formula 5-5-4; claws small, simple.

Male genitalia (Figs. 2, 3) with tegmen well sclerotized; basal piece dorsoventrally flattened, arched dorsally, widest at apical ¼, rounded and slightly asymmetrical at base, membranous ventrally. Fused parameres

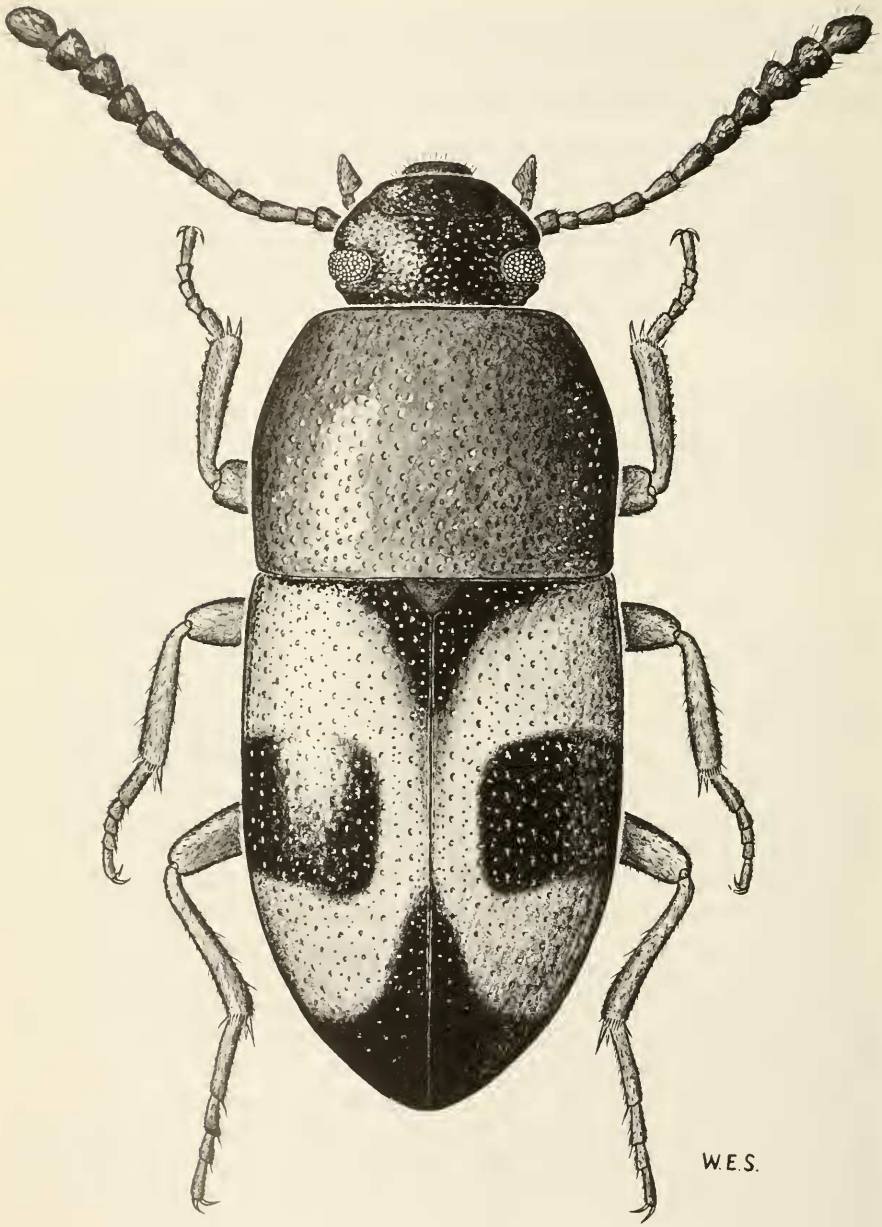
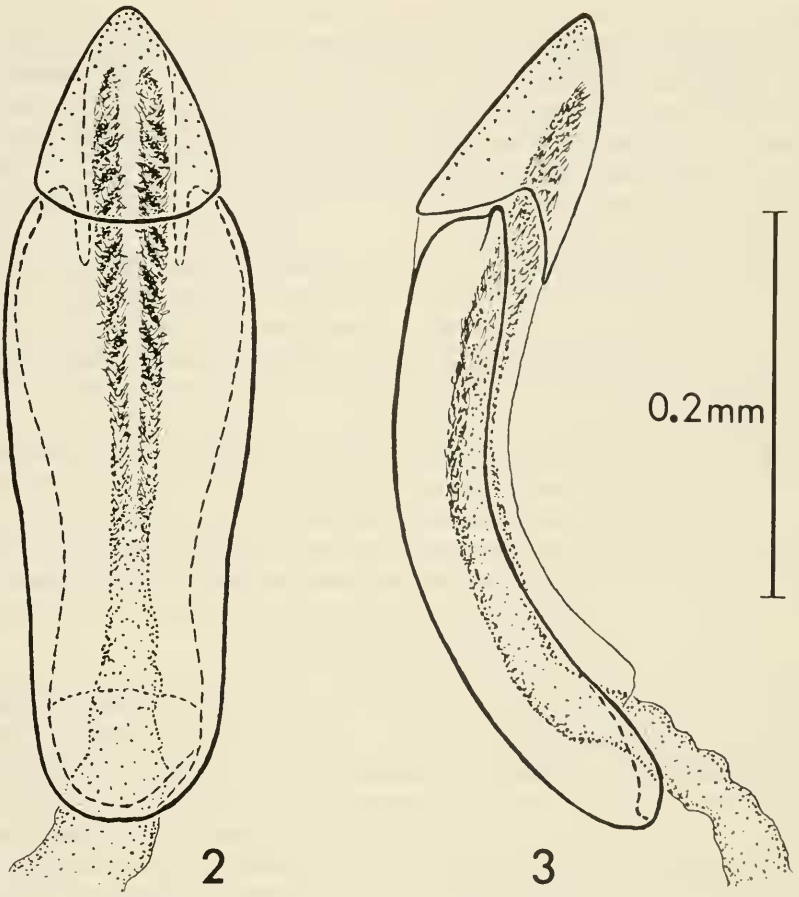


Fig. 1. *Poecilocrypticus formicophilus*, dorsal habitus.



Figs. 2, 3. *Poecilocrypticus formicophilus*, male genitalia. 2, Dorsal view. 3, Lateral view.

forming a conical apex, with scattered small punctures dorsally; basal processes (struts) short. Median lobe membranous; internal sac laterally lined with 2 longitudinal, dense patches of fine spicules; lining of sperm duct granular. Female genitalia unmodified; styli short, 1 segmented, setose apically.

Variation.—The elytral color pattern in *P. formicophilus* is quite variable, as was noted by Gebien (1928). He figured three elytra which differed in the extent and shape of the black areas. The form described and illustrated above is that of the holotype, and represents an intermediate coloration in the series of specimens available. The basal dark band varies in shape and extent, and in one of the paratypes from Argentina the elytra are entirely

yellow at the base, and the median and apical black patches are reduced in size. The head is reddish in this specimen also. Other specimens from the same locality and the U.S. have a darkened stripe along the suture that connects the basal dark band and apical patch; this stripe varies from a fine sutural line (as in the Alabama specimens) to a wide band that blends into the black median patch, separating the C-shaped yellow area into two quadrate patches (as in the specimen from Mississippi). The antennae may be uniformly pale colored.

All four specimens in the type-series are probably males; the female specimens from Florida and Alabama are slightly larger than the others, with a more robust and rounded pronotum. In addition, the antennae in females are shorter and less robust in proportion to body size than in males. Unlike many other tenebrionids, however, there are no noticeable sexual differences in the front tarsi.

Figures 2 and 3 of the male genitalia were drawn from one of the paratypes of *P. formicophilus*; these structures in males from North America are identical to those of the paratype from Argentina.

Specimens examined and known distribution.—In addition to the type-series from South America and the 5 specimens from the Gulf States, 29 other specimens found in collections of unidentified beetles were examined, for a total of 38 specimens with the following data:

South America: ARGENTINA: Buenos Aires: Mendoza, 3 ♂ labeled "cotype"; Santiago del Estero: "Chaco," Sept. 1903 (E. R. Wagner), 1 ♂; 1914 (E. R. Wagner), 2 ♂, 3 ♀. BOLIVIA: Santa Cruz: 20 km N. Montero, 31 Dec. 1970 (R. T. Allen), "treading," 8 ♂, 6 ♀; 4 km W. Portachuelo, 17 Dec. 1970 (R. T. Allen), "cane debris," 1 ♂. BRAZIL: Pernambuco: Pery-Pery, 5 June 1892 (Gounelle), 1 ♀; Rio Grande do Norte: Ceará Mirim, 6–7 July 1969 (P. & P. Spangler), 1 ♀; Rio Grande do Sul: São Leopoldo (Heyer), 1 ♂ labeled "type." PARAGUAY: Paraguari: Sapucay, Mar. (W. T. Foster), 1 ♂. URUGUAY: Montevideo, 30 Aug. 1962 (Silviera-Guido), "*saevissima richteri* nest," 1 ♂; 21 Dec. 1922 (F. Felippone), 1 ♂.

North America: USA: ALABAMA: Russell Co., 6 km S. Crawford, 9 April 1980 (W. E. Steiner), 1 ♂, 1 ♀; 10 April 1980 (W. E. Steiner), 1 ♂. FLORIDA: Leon Co., Tall Timbers Res. Sta., 29 May 1978 (M. Altieri), "In pitfall trap; in corn field," 1 ♀. MISSISSIPPI: Hancock Co., Bay St. Louis (Diamondhead), 19 Feb. 1978 (W. E. Steiner), "Pine woods; in humus under opossum dung," 1 ♂.

An additional 3 specimens are labeled as intercepted at U.S. ports in shipments from Argentina: "Ex Argentina, 6 May 1933, N.Y., in grapes," 1 ♂; "Ex Argentina, New York, N.Y., 20 May 1940," 1 ♂; "Ex Argentina, 29 May 1937, on grapes, New Orleans," 1 ♀.

The type-specimens are deposited in the Frey Museum, Munich (Tutzing), West Germany; other specimens are in the National Museum of Natural

History, Washington, D.C., the Museum National d'Histoire Naturelle, Paris, the University of Arkansas Collection, Fayetteville, the Florida State Collection of Arthropods, Gainesville, and in my private collection.

Remarks.—Although the species is apparently widespread, it probably is not often collected because of its small size. It also appears to be flightless, so it would not be taken in light traps. I suspect that the species is much more abundant than indicated by the collection data at present; the observations on habits and habitat discussed below suggest that this beetle is probably a common soil surface insect in open, disturbed areas and would be expected to occur frequently in turf samples and pitfall traps.

The beetle may not be recognized as a tenebrionid by the general collector; the bright coloration, body form, and active running behavior make it resemble a mycetophagid. *Poecilocrypticus formicophilus* may also be confused with another tenebrionid, *Alphitophagus bifasciatus* (Say), a widespread beetle of occasional economic importance (Triplehorn, 1965). The markings and coloration are not as striking in the latter species, but the light and dark banded elytra, general body form and size make it resemble *P. formicophilus*. In *A. bifasciatus* the elytral apices and abdominal sterna are light colored rather than black, the dorsal pubescence is more prominent, and (in males) the clypeus is ornately sculptured.

Biology

The type-specimen from southern Brazil is pinned with two ants on cards, labeled as "*Prenolepis fulva* Mayr." According to Gebien (1928), the beetles were found under moist bark among soil partitions of an abandoned part of an ant nest. The hindgut of the dissected paratype contained rough, dark colored, granular material, probably soil particles.

The specimen from Montevideo, Uruguay is labeled "*saevissima richteri* nest," in reference to the fire ant, *Solenopsis richteri* Forel. A survey of animals associated with fire ants was done by Silviera-Guido (1972), who collected the above specimen; 28 species of Coleptera were listed but not identified. The ant above and the closely related *S. invicta* Buren have been introduced to the Gulf States from South America (Buren, 1972); *Poecilocrypticus* could have been introduced with one or both of these species of imported fire ants. The localities where *P. formicophilus* has been taken surround Mobile, Alabama, where *Solenopsis* spp. were supposedly first introduced.

Two other myrmecophilous beetles were presumably introduced from South America in this manner. *Myrmecosaurus ferrugineus* Bruch (Staphylinidae), a species described from Argentina, has been taken in fire ant nests in Alabama, Florida, and Louisiana (Frank, 1977). *Myrmecaphodius excavaticollis* (Blanchard) (Scarabaeidae), also from Argentina, is common wherever fire ants occur in the Gulf States (Woodruff, 1973). These and

other beetles were listed as inquilines in fire ant nests in the U.S. (Collins and Markin, 1971) but no tenebrionids have previously been associated with imported fire ants.

Poecilocrypticus formicophilus has not been found in close association with *Solenopsis* spp. in the U.S., but fire ant mounds were very common at the localities where I collected the beetle in Mississippi and Alabama; some ant nests that I examined yielded *Myrmecosaurus* and *Myrmecaphodius*. At the Alabama site, specimens of *P. formicophilus* were seen running rapidly in open, sparse turf in bright sunlight; specimens of the related tenebrionid *Gondwanocrypticus* were also taken there in this situation. My single specimen of *P. formicophilus* from Mississippi was taken (with some leiodids) in leaf litter beneath old remains of opossum droppings, in a narrow strip of disturbed, secondary growth pine forest. Fire ant mounds were located 20–30 m from each of these sites.

The beetle seems to be feeding on decaying organic plant debris. Gut contents of the above specimens was made up of fibrous plant tissue, plant hairs, fungus spores, and other particulate matter.

The collection data at present suggest that *P. formicophilus* is associated with imported fire ants, but probably is an occasional ant nest scavenger rather than a specialized myrmecophile, being more agile and free-living than some other more specialized ant guests. Its immature stages are unknown, however, and may be found to be more closely associated with ant nests. The establishment of this beetle in North America probably will be of no economic importance, but further study is needed to better define the niche of this interesting species.

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